

IN THE CLAIMS:

Please amend Claims 1 and 4 as follows. In accordance with the revised amendment format, all claims are presented below.

1. (Currently Amended) A charge transfer apparatus comprising:

- a semiconductor region of one conductivity type;
- a charge transfer region of a conductivity type opposite to the conductivity type of said semiconductor region that is formed in said semiconductor region and joined to said semiconductor region to form a diode, ~~said diode having an impurity distribution which is uniform along a direction of signal charge transfer;~~
- a signal charge input portion adapted to input a signal charge to the charge transfer region;
- a signal charge output portion adapted to accumulate the signal charge transferred from the charge transfer region; and
- a plurality of independent potential supply portions adapted to supply a potential gradient to said semiconductor region, said plurality of independent potential supply portions supplying said semiconductor region with respectively different potentials, said plurality of independent potential supply portions being ohmically connected to each other through said semiconductor region,

wherein the signal charge in the charge transfer region is transferred by the potential gradient formed by said plurality of potential supply portions, and

wherein the signal charge in said charge transfer region is transferred by drift over all of said charge transfer region.

2. (Original) An apparatus according to claim 1, wherein the charge transfer region is completely depleted before the signal charge is input.

3. (Previously Amended) An apparatus according to claim 2, wherein the charge transfer region is buried in said semiconductor region and forms a buried diode together with said semiconductor region.

4. (Currently Amended) A charge transfer apparatus comprising:

- a semiconductor substrate of one conductivity type;
- a well of a conductivity type opposite to the conductivity type of said semiconductor substrate that is formed in said semiconductor substrate;
- a charge transfer region of a conductivity type opposite to the conductivity type of said well that is formed in said well and joined to said well to form a diode, ~~said diode having an impurity distribution which is uniform along a direction of signal charge transfer;~~
- a signal charge input portion adapted to input a signal charge to the charge transfer region;
- a signal charge output portion adapted to accumulate the signal charge transferred from the charge transfer region; and
- a plurality of independent potential supply portions adapted to supply a potential gradient to said well, said plurality of independent potential supply portions supplying said ~~semiconductor region well~~ with respectively different potentials, and said

plurality of independent potential supply portions being ohmically connected to each other through said well,

wherein the signal charge in the charge transfer region is transferred by the potential gradient formed by said plurality of potential supply portions, and

wherein the signal charge in said charge transfer region is transferred by drift over all of said charge transfer region.

5. (Original) An apparatus according to claim 4, wherein the charge transfer region is completely depleted before the signal charge is input.

6. (Original) An apparatus according to claim 5, wherein the charge transfer region is buried in said well and forms a buried diode together with said well.

7-17 (Cancelled)